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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/898,660	07/02/2001	Charles J. Schaeffer	054821-0116	5042

26371 7590 07/14/2004
FOLEY & LARDNER
777 EAST WISCONSIN AVENUE
SUITE 3800
MILWAUKEE, WI 53202-5308

EXAMINER

YUAN, DAH WEI D

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 07/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/898,660

Applicant(s)

SCHAEFFER ET AL.

Examiner

Dah-Wei D Yuan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 6/1/04.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 39,41-52 and 55-58 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 44 and 45 is/are allowed.
- 6) ☒ Claim(s) 39,42,43,50-52 and 55-58 is/are rejected.
- 7) ☒ Claim(s) 41 and 46-49 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 7/2/01 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

BATTERY WITH GRID

Examiner: Yuan S.N. 09/898,660 Art Unit: 1745 July 11, 2004

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 26, 2004 has been entered. Claims 41,46,49-52 were amended. Claims 127-139 were added.

2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action issued on December 29, 2003.

Claim Rejections - 35 USC § 112

3. The claim rejections under 35 U.S.C. 112, first paragraph, on claims 41,46-52 are withdrawn, because claim 41 has been either amended or cancelled.

Claim Rejections - 35 USC § 103

4. Claims 39,50-52,55-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wirtz et al. (US 5,611,128) in view of Misra et al. (5,851,695) as evidenced by Rao (5,958,625).

With respect to claim 39, Wirtz et al. teach a production line to make positive and negative grids of a battery. The method comprises the formation of a web (24) of a plurality of

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interconnected successive grid blank (26), which is continuously cast from a molten lead composition by a continuous casting machine. Figure 4 shows the battery grid including a network of a plurality of spaced apart grid elements (202). The grid elements are joined by one of a plurality of nodes (206). The web is reduced in cross section and elongated in the direction of travel by a series of compression roller machines. Subsequently, an electrochemically active paste is applied to the reduced web as it passes through the pasting machine. The pasted web is advanced by a powered belt conveyor into the cutting machine, which cuts the web (24) into individual pasted plate. See Column 3, Line 61 to Column 4, Line 4; Column 5, Lines 60-61; Column 6, Lines 10-12. However, Wirtz et al. do not teach a first transverse cross section of the grid element is different from a second transverse cross section of the opposed grid element. Misra et al. teach a method to fabricate battery grid for a lead acid battery, wherein grid (88) includes an outer peripheral member (220,222) and intermediate members (224,226). See Figure 14. Misra et al. disclose the longitudinally and vertically extending elongated members 224, 226 having diamond and triangular cross-sectional areas, respectively. Also, the outer peripheral members (220,222) are preferably of generally hexagonal cross section. See Figure 21. Misra et al. also conclude that polygonal cross-section of various members provides enhanced paste adherence to the grid over that achieved if circular cross-section members are used. The diamond and triangular shapes of elongated paste support members (224,226) provides good adherence between the active material paste and the grid. See Column 18, Lines 55-61; Column 19, Lines 5-25; 49 to Column 20, Line 5. Therefore, it would have been obvious to one of ordinary skill in the art to modify the cross-sectional area of the grid elements in the method of

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making a battery of Wirtz et al., because Misra et al. teach the resulting paste adherence to the battery grid can be enhanced if different cross-sections, such as hexagonal and diamond, are employed at the opposed ends of the grid element. Also, it is well known in the battery art that the conductive grid is also used as a current collector for the battery. This is supported in Rao (US 5,958,625). See Column 1, Lines 16-19.

With respect to claims 50, 51, Wirtz et al. teach a web of a plurality of interconnected successive grid blanks is continuously cast from a molten lead composition by a continuous casting machine. The moving web (24) is reduced in cross section and elongated in the direction of travel by a series of compression roller machines. See Column 3, Line 61 to Column 4, Line 4.

With respect to claim 52, Wirtz et al. teach the web passes through a continuous pasting machine (44), which applied battery paste to the web. See Column 4, Lines 6-9.

With respect to claim 55, Wirtz et al. teach the battery grid is reduced in cross section and elongated in the direction of travel by a series of compression (deformation) roller machines. See Column 4, Lines 2-4.

With respect to claim 56, the pasted plates as described above are assembled in a battery cell (510) as shown in Figure 20.

With respect to claim 57, a diluted sulfuric acid is used as the electrolyte in the battery. See Column 10, Lines 51-54.

With respect to claim 58, the web contains a lug as shown in the top portion of Figure 4.

5. Claims 42,43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wirtz et al. (US 5,611,128) and Misra et al. (5,851,695) as applied to claims 39,50-52,55-58 above, and further in view of Kao (WO 99/27595) et al.

With respect to claim 42, Wirtz et al. and Misra et al. disclose a method of making a battery as described above in Paragraph 4. However, Wirtz et al. and Misra et al. do not disclose forming at least a portion of the grid by stamping. Kao et al. disclose a grid made by stamping, or punching the grid from a continuous sheet of lead material wherein the sheet may be formed by a continuous casting process or a rolling process. The grid shapes likely result from a progressive punching operation, i.e., features will be added to the grid through several punching operations. The punched strip is processed to add active material (paste) and a paper layer, and then the strip is cut onto individual grids. Kao et al. also teach that the battery grid formed by a stamping process has improved corrosion and electrical performance over those grids made by other processes. See Page 4, Lines 16-18; Page 5, Lines 4-10. Therefore, it would have been obvious to one of ordinary skill in the art to incorporate a stamping process in the fabrication of the grid elements into the method of Wirtz et al. and Misra et al., because Kao et al. teach the battery grid made by stamping process has better corrosion and electrical performance.

With respect to claim 43, Wirtz et al. teach the transverse cross section of the grid element can have different shapes, such as hexagon, triangle or diamond. See Figure 21.

Double Patenting

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

7. Claims 39,42,43,55 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-14 of U.S. Patent No. 6,274,274 B1. Although the conflicting claims are not identical, they are not patentably distinct from each other. The instant application claims a method of making a battery, including battery plates, by

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forming a strip of interconnected grids, and forming at least a portion of the grid elements.

While the '274 patent claims a method of making a plurality of battery plates comprising forming a strip of interconnected battery grids and deforming at least a portion of the grid wire element. The claims of the instant application encompasses the claims of the '274 patent.

Allowable Subject Matter

8. Claims 44,45 are allowed. The following is a statement of reasons for the indication of allowable subject matter: The invention of independent claim 44 recites a method of making a battery comprising forming a strip of interconnected grids from a grid material, forming at least a portion of the grid of the grid elements, applying paste to the strip, cutting the strip to form a plurality of plates, wherein forming at least a portion of the grid elements comprises stamping the grid element, wherein a first transverse cross-section substantially has a shape selected from the group comprising diamond, oval, rhomboid, hexagon, and octagon and wherein the network and each of the frames define opposed substantially planar surfaces, and each first transverse cross-section does not extend beyond the planar surfaces. The closest prior arts of record, Wirtz et al. and Misra et al., do not teach or suggest the first transverse cross-section does not extend beyond the planar surfaces of the frames in the battery grid as stated in the claim. The invention of independent claim 45 recites a method of making a battery comprising forming a strip of interconnected grids from a grid material, forming at least a portion of the grid of the grid elements, applying paste to the strip, cutting the strip to form a plurality of plates, wherein the network and each of the frames define opposed substantially planar surfaces, and each second

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transverse cross-section does not extend beyond the planar surfaces. The closest prior arts of record, Wirtz et al. and Misra et al., do not teach or suggest the second transverse cross-section does not extend beyond the planar surfaces of the frames in the battery grid as stated in the claim.

9. Claims 41,46-49 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 41 would be allowable because the prior art does not disclose or suggest rotating at least a portion of the wire at the position intermediate the opposed ends of the wire. Claims 46-48 would be allowable because the prior art does not disclose or suggest feeding a continuous strip of the grid material along a linear path aligned with the longitudinal direction of the strip and punching grid material out of the strip to form the strip of interconnected grids. Claim 49 would be allowable because the prior art does not disclose or suggest feeding a continuous strip of the grid material along a linear path aligned with the longitudinal direction of the strip, piercing apertures in the strip of the grid material and laterally expanding the strip of grid material to form the strip of interconnected grids.

Response to Arguments

10. Applicant's arguments filed on March 26, 2004 have been fully considered but they are not persuasive.

Applicant's principle arguments are

Neither Wirtz, Misra and Rao disclose, teach or suggest a method that includes the step of modifying at least one existing wire at a position intermediate the opposed ends of the wire.

In response to Applicant's arguments, please consider the following comments.

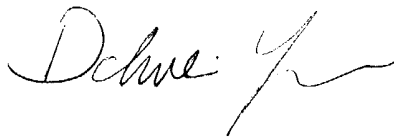
Misra et al. conclude that polygonal cross-section of various members provides enhanced paste adherence to the grid over that achieved if circular cross-section members are used. The diamond and triangular shapes of elongated paste support members (224,226) provides good adherence between the active material paste and the grid. Therefore, it would have been obvious to one of ordinary skill in the art to modify the cross-sectional area of the grid elements during the continuous casting process and subsequent compression rolling process of Wirtz et al. so as to have a first transverse cross-section taken intermediate the opposed ends of the wire differing from a second transverse cross-section of the wire taken at one of the opposed ends of the wire, because Misra et al. teach the resulting paste adherence to the battery grid can be enhanced if difference cross-sections, such as hexagonal and diamond, are employed at the opposed ends of the grid element.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dah-Wei D. Yuan whose telephone number is (571) 272-1295. The examiner can normally be reached on Monday-Friday (8:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dah-Wei D. Yuan
July 11, 2004

A handwritten signature in black ink, appearing to read "Dah-Wei D. Yuan", with a stylized flourish at the end.